HIGH-ENERGY PHYSICS

# Panel Presents a Vision for Physics After the Supercollider

Particle physicists like to trace the roots of their field to the atomic theories of philosophers such as Democritus. But in the past, U.S. physicists have tended to overlook something else that was well known to the ancient Greeks: the dangers of hubris. Aspiring to understand matter and energy at its fundamental level, they overreached budgetary realities and suffered a tragic downfall when the $11-billion Superconducting Super Collider was canceled. Last week, however, in a report meant to outline a new future of high-energy physics, the field's leaders presented an uncharacteristically modest vision.

"We are no longer in a position of world hegemony," acknowledged John Peoples, director of the Fermi National Accelerator Laboratory, echoing the view of the panel, which was established last January by Congress and the Department of Energy and led by physicist Sidney Drell of the Stanford Linear Accelerator Center (SLAC). Physics without hegemony, according to the panel's report, means trying to continue ongoing projects at existing U.S. laboratories while looking to international collaborations for access to larger machines and higher energies. Indeed, the report puts top priority on participation in Europe's planned Large Hadron Collider (LHC) and research on a future international accelerator. If its recommendation for a modest funding increase isn't met, the report opts for sacrificing a domestic facility to make way for these collaborations.

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**Modest proposal.** Sidney Drell.

The Drell panel submitted its recommendations last week to the High-Energy Physics Advisory Panel (HEPAP), a group of prominent physicists that regularly advises the government about particle physics. HEPAP unanimously approved the plan and will forward it to the Secretary of Energy, who in turn will ask Congress to consider the panel's request for an additional $150 million for the field. The extra money would come as a $50 million "bump" on the field's base funding—now $630 million—in 1996, 1997, and 1998.

If the money comes through, the report recommends that work continue at the world's largest accelerator, Fermilab's Tevatron, now trying to pin down the top quark. It also calls for continued funding of projects at SLAC, Cornell University, and Brookhaven National Laboratory. At the same time, the report says that a U.S. role in the LHC, which is under construction at CERN in Geneva, is essential if U.S. physicists are to remain active at the "high-energy frontier." The $3-billion LHC, scheduled to be completed in about a decade, will be less powerful than the SSC, but the SSC's demise has left the LHC at the forefront of physics. The Drell report recommends contributing between $5 and $10 million to the project in 1995 and 1996 and increasing amounts thereafter.

To ensure the long-term future of the field, the panel also urged U.S. physicists to make an "enhanced effort in accelerator research and development in preparation for a strong role in creating the accelerators of the next century." Though the report doesn't specify a particular project, nearly all physicists agree that the next step after the LHC should be a long, straight linear collider, a larger version of the one now operating at SLAC. While planners insist that this project must be international from the outset to avoid the sad fate of the SSC, physicists in the United States and Japan are already vying to build it on their own soil (see box).

Much to the relief of physicists, this newly modest vision got a good initial reception from Congress. Drell testified before the House Science Subcommittee and was commended by committed SSC foe Sherwood Boehlert (R–NY) "for being realistic." Boehlert added, "I haven't always seen this in the high-energy physics community."

But subcommittee staffers warned that those encouraging words are no guarantee that the physicists' request will survive the appropriations process for the 1996 through 1998 budgets. If they don't, Drell recommends the "draconian" approach of killing off a domestic project rather than draining money across the board. Any cut in the existing program will be painful, says Stanley Wojcicki of SLAC. "It's like asking whether you want to cut off your arm or your leg," he says. But the Drell panel, having delivered a realistic prescription to U.S. physics, is leaving the role of surgeon to a future panel.

**–Faye Flam**

## Competition Looms for a Linear Collider

When a panel of prominent U.S. physicists led by SLAC's Sidney Drell presented a newly modest blueprint for the future of the field last week, they disavowed hegemony. Eschewing huge single-nation projects, they pinned their hopes on international collaborations (see main text). But the course of those collaborations may not run smoothly, as a letter to Drell from a leading Japanese physicist made clear.

The letter concerned the project many physicists are counting on for the long-term future of the field: a massive linear collider that could explore the realm of energy targeted by CERN's Large Hadron Collider (LHC), but in finer detail. The big linear collider, like the LHC, will almost certainly be built as an international collaboration. Until last week, physicists had generally skirted the question of just where, but in the letter, physicist Hirotaka Sugawara, director of the KEK laboratory, made the opening bid in what is likely to be a contentious struggle for the project.

Japan plans to "work towards the construction of the electron-positron linear collider as [a] domestic project," wrote Sugawara. In calling for a "domestic" project, Sugawara does not mean to exclude other collaborators, says Aki Maki, another Japanese physicist. But the letter states that Japan wants to take the lead—although it's not clear yet whether this is the view of the Japanese government.

This attitude may portend a break from the collegial nature of earlier planning for the collider, which physicists expect to stretch 87 kilometers and cost from $2 to $3 billion. While it would achieve lower energies than the LHC, it should create "cleaner" particle collisions, allowing physicists to study new particles in greater detail.

Though Japan has made the most explicit bid for this prize, it isn't the only country eyeing it. Drell acknowledges that his own laboratory, SLAC, is also working on linear collider designs. Fermilab director John Peoples says Russian and European physicists might also bid for the project. It's all perfectly natural, he says. "If we believe in international collaboration, we have to expect competitors to have comparable aspirations."

**–F.F.**